

Candidate Information Bulletin



UTAH Electrician

Examinations

- Utah Electrical Licensing Examination for Journeyman Electricians
- Utah Electrical Licensing Examination for Residential Journeyman Electricians
- Utah Electrical Licensing Examination for Master Electricians
- Utah Electrical Licensing Examination for Master Residential Electricians

Eligibility and Examination Approval

Eligibility to sit for a license qualification test is determined by the state of Utah, Division of Occupational and Professional Licensing. For detailed information about eligibility requirements, write, phone, or download the information from the Internet:

State of Utah
Department of Commerce
Division of Occupational and
Professional Licensing
160 East 300 South, P.O. Box 146741
Salt Lake City, Utah 84114-7641
Phone: 801.530.6628

<http://www.commerce.state.ut.us/dopl/dopl1.htm>

Licensure applications may be obtained by contacting:

Exterior
5486 South 1900 West, Suite C
Taylorsville, UT 84118
Phone: 801.359.4417 or
801.355.5009

Completed applications along with fees must be submitted to the state of Utah, Division of Occupational and Professional Licensing. If you are approved to take the examination, the Division will send a letter of approval to you. This letter must be presented to Exterior at the time you register to take your examination.

Registering for the Examination

Examinations are administered five days a week (Mon.-Fri.) at Exterior located at 5486 South 1900 West, Suite

C, Taylorsville, Utah 84118, and once per month in St. George, Utah. Register for the examination either:

1. **By mail.** Complete the enclosed **EXAMINATION APPLICATION** and return it by mail along with your letter of approval and your exam fee to Exterior. You will be scheduled for an appointment at the first available time approximately one week after your application is received. Exterior will mail you an admission letter providing you with the exact date and time.
2. **By telephone.** You can schedule your appointment by calling Exterior at 801.355.5009, between 8:30 a.m. and 4:30 p.m., Monday through Friday, and paying for your examination using a major credit card (MasterCard or Visa). **Candidates must obtain a letter of approval prior to scheduling an examination.**

Payment must be made in advance. You may reschedule your examination for a \$10.00 rescheduling fee up to the time of your appointment. If you fail to appear for your appointment, your examination fee will be forfeited and you must reapply for the exam. No exceptions. **All examination fees are nonrefundable and nontransferable.**

Examination Fees (Subject To Change)

New Applicants	\$105.00
Retaking one section	\$80.00
Retaking 2 or 3 sections	\$105.00

Computerized Testing

Examinations are administered using Exterior's user friendly, windows-based, computerized testing system. Exterior uses IBM compatible personal computers, similar to what you may have at home or in your business. You do not need any computer experience to use this system. In fact, you will only need to use five keys on the keyboard to take the test. (The other keys are disabled—there is no way you can harm the computer, the program, or the test by **touching** the wrong key.)

Prior to beginning your examination you can take a practice exam to become familiar with the computer testing system. A staff member will be available to help you if you need further assistance.



You will receive your score at the conclusion of the examination.

Walk-In Testing

Candidates may “walk in” and test on a space-available basis for an additional \$10.00 fee. No reservation is required. The examination fee plus the walk-in fee must be paid prior to taking the examination. You **MUST** have a letter of approval for the Division of Occupational and Professional Licensing in order to take the examination.

Candidates with Special Needs

If you require a special testing accommodation under the Americans with Disabilities Act (ADA), please contact Experior to obtain an Accommodation Request Form. You will be required to submit written verification of your disability prior to scheduling your examination.

Out of State Candidates

If you are out of state, you may arrange with Experior to take the exam at any recognized testing center such as a university or community college. You must make the arrangements with the testing center and then send Experior the required information along with the fee that includes an additional \$50.00 out-of-state testing fee. Please include the following:

1. Candidate name, address and phone number
2. Name of Exam
3. Testing Center name, address, phone number, and the name of the contact person
4. Test Fees: exam fee (plus additional \$50.00 testing fee).
5. Letter of approval to test.

Candidates are responsible to pay the testing center any required fee.

Experior will mail the exam in a sealed envelope to the contact person at the testing center with instructions for administration. Experior will ship exams to the testing centers within one week after requests have been received. Candidates are responsible to check with the testing center to make sure the exam has arrived by the testing date. Candidates will have a two-week period to take the test once the exam has been shipped to the testing center.

After the exam, the testing center will then mail the exam back to Experior for scoring and the scores will be mailed to candidates within one week. Candidates are responsible for reporting their scores to the state.

Note: All out-of-state candidates will take paper/pencil exams.

The score report will show either PASS or FAIL and your percent. A minimum score of 70 percent is required to pass each part of the examination.

Scores

Strength and Weakness Reports and Exam Reviews

If you do not pass the examination, you are eligible for a Strength and Weakness Report or an Examination Review.

A Strength and Weakness Report is a summary of your performance in each of the subject areas covered in the exam. This will show you which areas you need to study before taking the next examination. The fee for the Strength and Weakness Report is **\$15.00**.

If you do not pass your examination you have the option of Reviewing your exam results. The purpose of a Review is to allow candidates to see how they performed in order to prepare for future testing. During the Review, you will be provided a list of questions you missed, the correct answer and your response to those questions. You will also receive a booklet that contains the same questions as those found on your computerized exam. This is not an oral review. You are not allowed to take anyone with you to the Review, and you are not allowed to take any notes during the Review.

Reviews are given in the Experiior office. A Review application can be found in your score report envelope along with applicable instructions. The fee for a Review is **\$80.00**.

Description of the Exams

Each electrical exam has three parts:

The first part consists of code questions, and is open book. Some of the questions will require application of electrical theory and calculations. This is a two-hour exam, multiple-choice format consisting of 40 questions.

The second part is on the application of basic electrical theory, calculations, and general knowledge relevant to the industry. This exam is closed book. It is a two-hour exam, multiple-choice format consisting of 40 questions.

The third part is a written practical examination. You will be tested on the practical knowledge of using conduits, switching, motors and controls, transformers, trouble-shooting, and general knowledge. This exam is closed book. It is a two-hour exam, multiple-choice format consisting of 30 questions.

What to Bring to the Exam

You must bring the following to the exam:

- Your admission letter;
- A photo identification (such as your driver's license); and
- Your letter of approval to test.

The **only** other materials allowed to be used during the CODE exams are:

1. *National Electrical Code* NFPA 70, current edition, or the *National Electrical Code Handbook*
2. *Construction Trades Licensing Act*
3. *Model Energy Code*, current edition, CABO (Master and Master Residential ONLY)
4. One of the following:
Wing's Criss-Cross Index of the NEC
Ferm's Fast Finder Index
Ugly's Electrical References

Exterior will provide you with a calculator. This calculator will be allowed during the THEORY examination only. Personal calculators of any type are **NOT** permitted.

Content Areas

The Master Electrician (ME), Journeyman Electrician (JE), Master Residential Electrician (MRE), and Residential Journeyman Electrician (RJE) exams are based on the following content areas. Under each subject heading is shown the approximate percentage of questions in that content area for each exam.

1. Grounding and Bonding

ME 11% JE 11% MRE 12% RJE 12%
Determination of system and circuit grounding requirements, methods and location of grounding connections. Calculating grounding conductor size, bonding of enclosures, equipment and metal piping systems.

2. Services, Feeders, Branch Circuits, and Overcurrent Protection

ME 11% JE 12% MRE 14% RJE 14%
Knowledge of code rules covering services, feeders, and electrical loads. Determination of proper size, type and rating of conductors for services and feeders. Installation of panelboards, switchboards and overcurrent devices. Knowledge of circuit classifications, ratings, design and use requirements. Application of code rules covering electrical outlets and devices, including wire connectors and methods.

3. Raceways and Enclosures

ME 10% JE 14% MRE 8% RJE 8%
Knowledge of all types of raceways and their uses. Determining proper size, conductor fill, support, and methods of installation. Application of proper type, use and support of boxes and cabinets, etc.

4. Conductors

ME 8% JE 10% MRE 14% RJE 14%

Determination of ampacity type of insulation, usage requirements, methods of installation, protection, support and termination.

5. Motors and Controls

ME 10% JE 9% MRE 3% RJE 3%

Knowledge of code rules governing installations of motors and controls. Includes calculations for short-circuit, ground-fault and overload protection, motor feeders, branch circuits and disconnecting means. Knowledge of all control circuits and motor types, application and usage.

6. Utilization and General Use Equipment

ME 9% JE 10% MRE 14% RJE 14%

Knowledge of code rules covering lighting, appliances, heating and air conditioning equipment, generators, transformers, etc.

7. Special Occupancies/Equipment

ME 10% JE 10% MRE 7% RJE 7%

Knowledge of code rules as they apply to hazardous locations, health care facilities, places of assembly, etc. Includes code rules on signs, welders, industrial machinery, swimming pools, etc.

8. General Knowledge of the Electrical Trades and Calculations

ME 24% JE 17% MRE 22% RJE 22%

Terminology, practical calculations such as load computations, voltage drop, conductor derating, power factor, voltage and current ratings of equipment and branch circuits.

9. Low Voltage Circuits, Including Alarms and Communications

ME 5% JE 5% MRE 4% RJE 4%

Knowledge of circuits and equipment. All signal, alarm, and sound systems.

10. State Laws and Rules

ME 2% JE 2% MRE 2% RJE 2%

State Regulations regarding electrical installations that add to or modify the *National Electrical Code*. State licensing requirements.

Written Practical

11. Conduit

ME 9% JE 17% MRE 7% RJE 7%

12. Switching

ME 11% JE 18% MRE 21% RJE 21%

13. Motors and Controls

ME 25% JE 13% MRE 3% RJE 3%

14. Transformers

ME 22% JE 12% MRE 3% RJE 3%

15. General Knowledge

ME 15% JE 24% MRE 46% RJE 46%

16. Trouble-Shooting

ME 18% JE 16% MRE 20% RJE 20%

References

The primary reference book for all exams is the *National Electrical Code*, NFPA 70, current edition. In addition, the following references are recommended study books. These materials may not contain all the general knowledge necessary within each classification.

1. *Construction Trades Licensing Act*, including *Rules of the Electricians Licensing Board*
2. *Model Energy Code*, current edition, CABO (Master and Master Residential ONLY)
3. *Alternating Current Fundamentals*, Duff and Herman, Delmar Publishers, Inc., Current edition
4. *Direct Current Fundamentals*, Loper and Tedsen, Delmar Publishers, Inc., Current edition
5. *Industrial Motor Control*, Herman and Alerich, Delmar Publishers, Inc., Current edition
6. *National Electrical Code Blueprint Reading*, Gebert, American Technical Publishers, Inc., Current edition
7. *American Electricians' Handbook*, McGraw-Hill Book Company, Current edition
8. *Guide to the National Electrical Code*, Harman and Allen, Prentice-Hall, Inc., Current edition

References may be found at the following locations:

Salt Lake Community College Bookstore, Dixie College Bookstore, Southern Utah University, Utah Valley State College Bookstore, Ogden-Weber Area Applied Technology Bookstore, College of Eastern Utah Bookstore, Sam Weller's Zions Bookstore (some locations), your local library

**For information on how to obtain
examination references, call toll-free
877.624.2562**

Sample Code and Theory Questions

The following sample questions illustrate the types of questions in some of the content areas. Select the closest answer for each question.

1. Conductors within electrical nonmetallic tubing may carry a **MAXIMUM** of
 - (A) 300 volts.
 - (B) 450 volts.
 - (C) 500 volts.
 - (D) 600 volts.

2. Given: Six, 230-volt, size 8 AWG, copper, type TW conductors are in a single 12' raceway operating at 80°F.

Each conductor may have a **MAXIMUM** load of

- (A) 28 amps.
- (B) 32 amps.
- (C) 40 amps.
- (D) 50 amps.

3. Disregarding all exceptions, if the copper service entrance conductors are size 3/0, the minimum size of the copper grounding electrode conductor must be **AT LEAST** size

- (A) 3/0 AWG.
- (B) 2/0 AWG.
- (C) 2 AWG.
- (D) 4 AWG.

4. Given: A 20 horsepower, wound-rotor, no code letter motor is to be installed with 480 volt, 3-phase alternating current.

Disregarding all exceptions, the **LARGEST** nontime delay fuse to provide short-circuit and ground-fault protection for the motor is

- (A) 30 amps.
- (B) 40 amps.
- (C) 50 amps.
- (D) 60 amps.

5. On typical wiring diagrams for magnetic motor control starters, overload heaters are shown in series with the

- (A) control circuit supplying the coil of the motor starter.
- (B) line contacts supplying power to the motor.
- (C) pilot light that indicates when the motor is stopped.
- (D) pilot light that indicates when the motor is on.

6. Given: A 120-volt lighting fixture has twelve 100 watt light bulbs which are all fed through a common fixture wire.

The **MINIMUM** size fixture wire for the one common wire that feeds the entire fixture is size

- (A) 16 AWG.
- (B) 14 AWG.
- (C) 12 AWG.
- (D) 10 AWG.

7. Wiring which is to provide external power to aircraft within aircraft hangars shall be installed **AT LEAST** how many inches above floor level?

- (A) 6"
- (B) 12"
- (C) 18"

(D) 24"

8. When the size of service entrance phase conductors are larger than 1,750 kcmil (MCM) aluminum, the bonding jumper should have an area of **NOT** less than what percent of the area of the largest phase conductor?

(A) 8.5%
(B) 10.0%
(C) 12.5%
(D) 20.0%

9. Given: A new 5-unit apartment building has a 120/240 volt, single phase service. Each apartment has a net computed load of 40 kVA. There is NO house load in the building.

Use the OPTIONAL method. The service of this complete 5-unit apartment building has a total net computed load of

(A) 40 kVA.
(B) 90 kVA.
(C) 120 kVA.
(D) 200 kVA.

10. A 240 volt, single phase, 15 kVA generator will supply

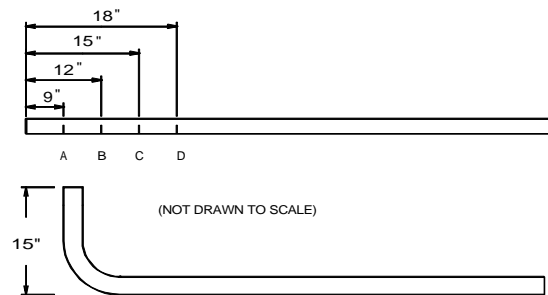
(A) 16 amps.
(B) 36 amps.
(C) 63 amps.
(D) 76 amps.

Answers to Sample Questions

- 1 - D, Section 331-4(6)
2 - B, Table 310-16 note 8
3 - D, Section 250-94, Table 250-94
4 - B, Table 430-150 & 430-152
5 - B, *American Electrician's Handbook*, Figure 7-126
6 - B, Section 402-5
7 - C, Section 513-10(a)
8 - C, Section 250-79(d)
9 - B, Section 220-32, Table 220-32
10 - C, *Direct Current Fundamentals*, Page 110

Sample Practical Questions

1. Refer to the figure below.



A length of 3/4" EMT is to have a 15" high (end-to-back) stub bent at the left end of the EMT.

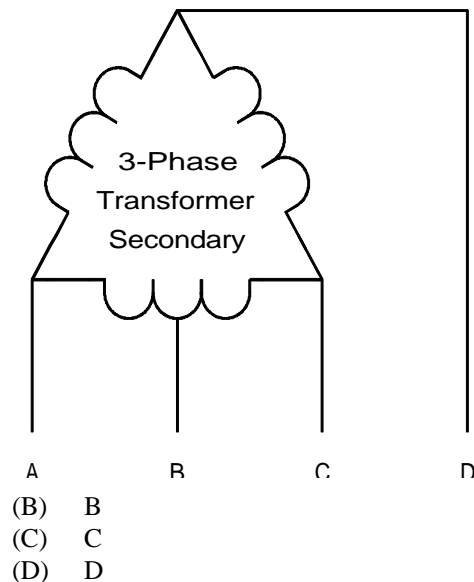
Where should the arrow on a standard EMT hand-bender be placed to make the desired bend?

(A) A
(B) B
(C) C
(D) D

2. Refer to the figure of a 120/240-volt transformer secondary below.

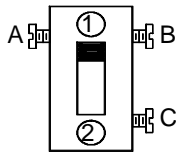
Which connection is the "high-leg" if the transformer has the neutral properly connected?

(A) A



(B) B
(C) C
(D) D

3. Refer to the figure below which represents a three-way switch.



NOTE: All of the terminal screws are the same color.

The results of continuity tests between terminals are as follows.

Switch in position 1

A to B Open
B to C Shorted
A to C Open

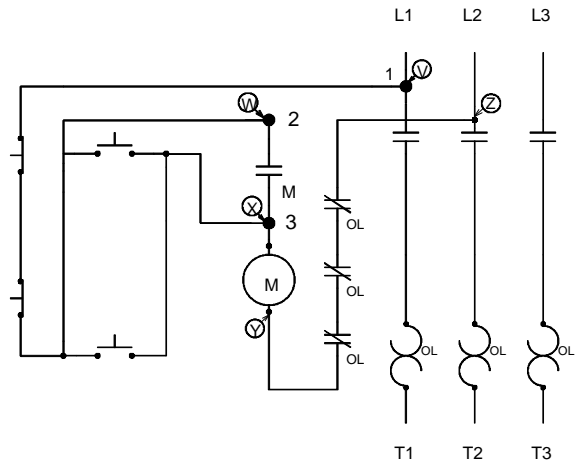
Switch in position 2

A to B Open
B to C Open
A to C Shorted

Which of the following terminal pairs are the correct connections for the travellers for a three-way switching circuit?

- (A) A, B
- (B) A, C
- (C) B, C
- (D) C, A

4. Refer to the trouble-shooting situation in the motor control circuit below.



Given: When power and control voltages are applied, the motor does not start. For trouble-shooting, all voltages are removed from this circuit. None of the pushbuttons are depressed.

For the purposes of this question, none of the conductors are broken or loose from the terminals indicated.

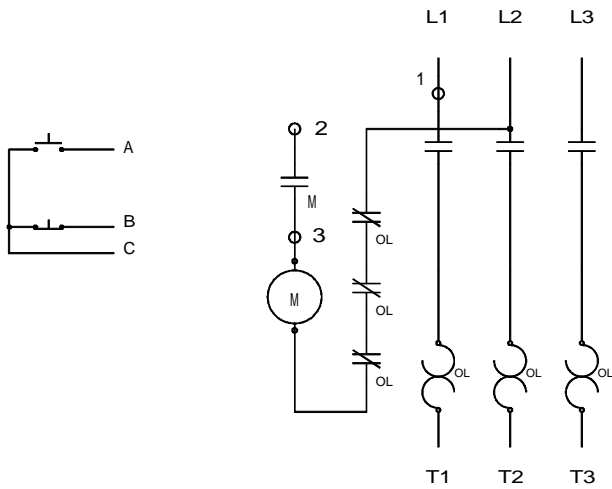
Resistances are measured between lettered points as follows.

X to Z	35 ohms
V to X	Zero ohms
W to X	Infinite ohms
X to Y	35 ohms

What is the problem?

- (A) The magnetic starter coil is open.
- (B) A start-button is shorted.
- (C) A stop-button is open.
- (D) An overload contact is open.

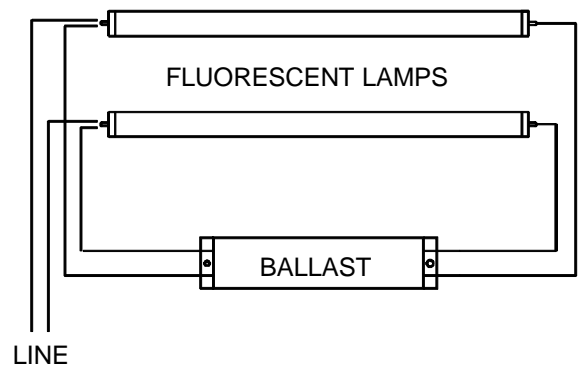
5. Refer to the motor control circuit below.



Which are the correct connections for a simple remote start-stop station?

- (A) A to 1, B to 2, C to 3
- (B) A to 2, B to 1, C to 3
- (C) A to 3, B to 1, C to 2
- (D) A to 2, B to 3, C to 2

6. Refer to the figure below which represents wiring of a fluorescent fixture.



Why are there two contacts at the left end of each lamp?

- (A) To increase the starting current of the lamps
- (B) To decrease the starting voltage of the lamps
- (C) To disconnect the source wiring when lamps are removed
- (D) To limit the replacement to lamps of the same wattage

Answers to Practical Questions

1-A; 2-D; 3-A; 4-B; 5-C; 6-C

Copyrighted Exam Questions

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5486 South 1900 West, Suite C
Taylorsville, Utah 84118
Phone: 801.355.5009
FAX: 801.355.4008

Electrical Licensing Examination Application

Note: This application must be either mailed or taken to Exterior with the examination fee. Make checks payable Exterior. You MUST include your letter of approval to test.

Please Print Clearly or Type

Name of Examinee: _____
Last First MI

Street Address: _____

City: _____ State: _____ Zip: _____

Telephone: (_____) _____ - _____ Social Security Number _____ - _____ - _____

Please select the examination below that you have been approved to take:

<u>Exam Name</u>	<u>Fee</u>	
<input type="checkbox"/> Journeyman Electrician	\$105.00	
<input type="checkbox"/> Journeyman Electrician Retake	\$105.00 for two or more parts	
Select which examination part you are retaking \$ 80.00 for one part (Select all that apply)		
<input type="checkbox"/> Code	<input type="checkbox"/> Theory	<input type="checkbox"/> Practical
<hr/>		
<input type="checkbox"/> Residential Journeyman Electrician	\$105.00	
<input type="checkbox"/> Residential Journeyman Electrician Retake	\$105.00 for two or more parts	
Select which examination part you are retaking \$ 80.00 for one part (Select all that apply)		
<input type="checkbox"/> Code	<input type="checkbox"/> Theory	<input type="checkbox"/> Practical
<hr/>		
<input type="checkbox"/> Master Electrician	\$105.00	
<input type="checkbox"/> Master Electrician Retake	\$105.00 for two or more parts	
Select which examination part you are retaking \$ 80.00 for one part (Select all that apply)		
<input type="checkbox"/> Code	<input type="checkbox"/> Theory	<input type="checkbox"/> Practical
		You do not have to take the practical section of the exam if you previously passed the practical section of the Utah Journeyman electrician exam. Taking Practical (check one) <input type="checkbox"/> Yes <input type="checkbox"/> No
<hr/>		
<input type="checkbox"/> Residential Master Electrician	\$105.00	
<input type="checkbox"/> Residential Master Electrician Retake	\$105.00 for two or more parts	
Select which examination part you are retaking \$ 80.00 for one part (Select all that apply)		
<input type="checkbox"/> Code	<input type="checkbox"/> Theory	<input type="checkbox"/> Practical
		You do not have to take the practical section of the exam if you previously passed the practical section of the Utah residential journeyman electrician exam. Taking Practical (check one) <input type="checkbox"/> Yes <input type="checkbox"/> No

Date of Exam: 1st choice: _____ 2nd choice: _____

Date of 1st Exam Taken: _____

Signature of Candidate: _____ Date: _____

☐ Check ☐ Money Order ☐ Visa ☐ MasterCard Credit Card # _____ Exp. Date: _____

